

Comparison of EN 13537 test laboratories.

Introduction

The European Outdoor Group (EOG) is a body which represents companies in the European Outdoor Sports industry. In most cases, the members are manufacturers and suppliers of camping, hiking and mountaineering equipment.

EN 13537 was published in 2002. The standard defines how a sleeping bag should be tested and labelled at point of sale. The standard has had considerable implications on sleeping bag manufacturers and retailers. Catalogues, websites and training materials have had to be rewritten to follow the specification.

Member companies voiced concerns to the EOG about EN13537. The EOG organised meetings of sleeping bag manufacturers and produced advice notes for manufacturers, retailers and consumers.

At the OutDoor Exhibition in Friedrichshaven in July 2004, the European Outdoor Group organised a meeting of all sleeping bag suppliers. Present at the EOG meeting were representatives from: Ajungilak, Berghaus, Bigpack, Caravan, Deuter, Exped, Lafuma, Haglofs, Jack Wolfskin, Macpac, Marmot, Millet, Mountain Equipment, Mountain Hardware, Salewa, Snugpak, Terra Nova, The North Face, Vango, Vaude and Western Mountaineering.

At this meeting, the brands agreed to cooperate to clarify issues about the implementation of EN 13537 for brands and manufacturers of sleeping bags and make a standard communication suitable for all brands to use for retailers and consumers.

A year later, the group met again to discuss the implementation of EN 13537 and problems that had been encountered. One concern was that the parts of the test did not appear to work. Another was a fear that different laboratories would give different values for the same sleeping bag. It was agreed that a sleeping bag should be sent to each test house in order to compare the results.

Comparison Procedure

It was decided that the most practical test was to send "identical" sleeping bags to each test house simultaneously. To send one sleeping bag on tour would not have been practical. The test requires washing and conditioning which would reduce the performance in subsequent tests.

1. Five test laboratories were identified.
2. Emails were sent simultaneously, saying that a manufacturer was looking to compare test houses to choose the best future test partner and asking for info - lead time, prices.
3. Time to respond to emails was recorded. Lead time and quoted costs were recorded
4. Tests were ordered.
5. "Identical" sleeping bags (same batch, same model, and same weight) were sent simultaneously to each laboratory.
6. As the results came in, they were noted in an Excel table. A comparison of test reports from each lab, lead time, pricing etc has been made.
7. A draft report will be sent to the laboratories for comment.
8. The results will be presented at the EOG meeting at the OutDoor exhibition on 25th July 2006.

9. The EOG will publish a report outlining the league table of test houses, variation found in testing etc. A number of magazines have expressed interest in the report and will publish articles based on its content.

Results

Results from all of the major test houses have been received and collated.

Thermal Resistance Results

All five laboratories performed this test. Only three were able to provide the breath ability tests to verify that the temperature test is valid.

The Thermal Resistance measured on the manikin had an average value of 0.923 m²K/W but varied from a low value of 0.86 to a high value of 0.971. This is the main value used to calculate the temperature recommendations for the sleeping bag.

The temperature results for the T extreme vary from -15C to -20.1 C with an even spread - two at the top, two at the bottom, and one in the middle.

The two most respected laboratories, Lyon and Hohenstein are at opposite extremes. The stated tolerance is plus or minus 1°C.

Dimension Test Results

Only three laboratories have the special measuring device and their measurements varied by a huge margin. The measured dimensions vary by 10cm in the total length and 6cm in the foot width. The stated tolerance is plus or minus 1 cm.

Commentary

Accuracy of Thermal Resistance Test

The results imply that the test accuracy achieved is $\pm 1.8^\circ \text{C}$ on the T Comfort, and $\pm 2.6^\circ \text{C}$ on T Extreme. Put simply, these results suggest that the test is only half as accurate as it is specified. In other words, the “error bars” should be twice as big as stated.

Accuracy of Dimension Test

The dimensions vary by 10cm in the total length and 6cm in the foot width. The stated tolerance is plus or minus 1 cm.

Simple measurements done in the design offices using a long stiff builder’s ruler appear to be much more repeatable than the fancy test equipment specified in EN 13537.

Thermal Test Tolerances

The design of the temperature tolerances in EN 13537 is poor. The scales are structured so that for a given insulation value, 3 degrees change in comfort temperature equates to 5 degrees change of extreme temperature. However, the tolerance is the same plus minus 1°C for each value. To achieve $\pm 1^\circ \text{C}$ on the T Comfort, the tolerance for T Extreme should be $\pm 1.5^\circ \text{C}$.

Dimensional Test Tolerances

The design of the dimensional tolerances in EN 13537 is poor. The tolerance is $\pm 1.0\text{cm}$ on all dimensions. However, this equates to $\pm 0.5\%$ on the length and $\pm 1.0\%$ on the foot width measurement. The achieved level appears to be $\pm 2.5\%$.

Conclusion

The original goal of this comparison was to demonstrate that the EN 13537 test works and is a good comparison for consumers. Sadly, it appears that the tests are unreliable and certainly not within the stated accuracy level.

Sceptics will argue that the results vary so much; it is no more accurate than looking at a sleeping bag and making a guess!

The poor accuracy on the dimensional tests is probably the most damning result. There is a danger that this will be used as an example to demonstrate that the test is meaningless. Almost everybody over the age of seven can manage to measure simple dimensions to an accuracy of $\pm 2.5\%$. We all expect shops and tradesmen to achieve better than $\pm 1\%$ on simple measurements. E.g. if you bought a curtain pole cut to length, would you accept it being 5cm too short.

Next Steps

The draft report is being sent to each laboratory. Each is asked to comment on the results and the conclusions.

It is hoped that the laboratories will cooperate to improve the accuracy of the results and propose a method which will satisfy their customers that the tests are accurate and repeatable.

Results are attached in an Excel list - see the orange panel lines 40 to 50.

Please send responses to

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